

Listing of Claims:

1. (Currently Amended) An apparatus for assisting navigation in a vessel (2), comprising:
 - a) a catheter having a sensor probe connected thereto, a) a sensor probe (3) for acquiring local images (5, 10) that characterize of cross-sections of the vessel (2) at the point where the particular local image is made, which the sensor probe (3) can be being movable along the vessel (2);
 - b) a memory (8) for storing a sequence of the local images (5) that is obtained in the course of the movement of the sensor probe (3) along the vessel (2);
 - c) a data-processing unit (7) that is arranged to sort a further local image (10) of the vessel (2) into the sequence that is stored in the memory (8), the sorting being based on similarities between the further local image and one or more of the local images of the sequence.
2. (Currently Amended) An apparatus as claimed in claim 1, wherein characterized in that the sensor probe is an intravascular ultrasound system (3) or a means for performing optical coherence tomography.
3. (Currently Amended) An apparatus as claimed in claim 1, wherein characterized in that it has a means (9) for moving the sensor probe (3) moves along the vessel (2) at a defined and preferably constant speed.
4. (Currently Amended) An apparatus as claimed in claim 1, further comprising characterized in that it comprises a display (6) for showing a stored sequence of the local images (5), wherein and in that the data-processing unit (7) is arranged to indicate on the display (6) the at least one of a position of the sensor probe (3), and/or the a position of an instrument (11) that is in a known position relative to the sensor probe (3) is indicated on the display.

5. (Currently Amended) A method of ~~assisting navigation~~ in a vessel (2), comprising:

- a) providing a catheter with a sensor probe;
movement, along the vessel (2), of ~~the~~ sensor probe (3) ~~and acquiring for making local images (5, 10) that characterize~~ of the vessel (2) at the point where the particular local image is made;
- b) ~~generation and storage of~~ a sequence of the local images (5) during the movement of the sensor probe (3);
- e) ~~sorting of a further local image (10), which is preferably made by the sensor probe (3), into the sequence; and~~
positioning a medical device coupled to the catheter based at least in part on the sorted further local image.

6. (Currently Amended) A method as claimed in claim 5, wherein characterized in that the local images are cross-sectional intravascular ultrasound images (5, 10) of the vessel (2) ~~or optical coherence tomographic images thereof.~~

7. (Currently Amended) A method as claimed in claim 5, wherein characterized in that the movement of the sensor probe in step a) for acquiring the sequence of local images takes place at a defined speed and the generation of local images (5) ~~in step b)~~ takes place at a defined rate.

8. (Currently Amended) A method as claimed in claim 5, wherein characterized in that the further local image (10) is assigned to one, or two adjacent ~~adjoining~~, images in the sequence with which the similarity of the further local images (10) is greatest.

9. (Currently Amended) A method as claimed in claim 5, wherein characterized in that ~~step e)~~ the sorting of the further local image is performed repeatedly for a series of further local images (10), with the search for a sorted position in the sequence held in store, for an image in this series, beginning in each case at the sorted position of the

previous further local image in the series.

10. (Currently Amended) A method as claimed in claim 5, ~~wherein~~ characterized in that the local images in the sequence are shown on a display (6) in line with their positions along the vessel (2), as also is the sorted position (10') of the further local image (10).

11. (New) The method of claim 5, wherein the local images and the further local image are acquired by the sensor probe through performing optical coherence tomography.

12. (New) The apparatus of claim 1, wherein the local images and the further local image are acquired by the sensor probe through performing optical coherence tomography.

13. (New) A method of positioning a medical device in a vessel, comprising:
providing a catheter with a sensor probe;
moving the sensor probe along the vessel and acquiring local images of the vessel at the point where the particular local image is made;
storing a sequence of the local images during the movement of the sensor probe;
connecting a medical device to the catheter, the medical device and the sensor probe being separated along the catheter at a known distance;
moving the medical device along the vessel and acquiring a further local image of the vessel at the point where the particular further local image is made;
sorting the further local image into the sequence based on a similarity between the further local image and one or more of the local images of the sequence; and
positioning the medical device coupled to the catheter based at least in part on the sorted further local image.

14. (New) The method of claim 13, further comprising moving the sensor probe along the vessel by pulling motion.
15. (New) The method of claim 13, wherein the medical device is a stent.
16. (New) The method of claim 13, further comprising performing geometrical corrections to the local images based on pre-existing images.
17. (New) The method of claim 13, further comprising determining the similarity between the further local image and the one or more of the local images of the sequence based on gray-value registration.
18. (New) The method of claim 13, wherein the local images and the further local image are acquired using ultrasound imaging.
19. (New) The method of claim 13, wherein the local images and the further local image are acquired using optical coherence tomography.
20. (New) The method of claim 13, wherein the local images are obtained by moving the sensor probe at a constant rate and acquiring the local images at a constant rate.